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Following the devastating December 2007 flood in Washington's Chehalis River Basin, local governments and the Tribes of the Chehalis Reservation intensified efforts to mitigate flood risk in one of the most flood-prone watersheds in the state by forming the Chehalis River Basin Flood Authority. The Authority quickly determined that improvements were needed to the existing early flood forecast and warning system used by both residents and governments in the Chehalis River Basin. The region required a more reliable information network instead of what had become a "word of mouth" warning process.

On behalf of the Flood Authority, WEST Consultants worked with community groups, Indian tribes, and local governments within the basin to assess current flood preparedness practices and needs. WEST reviewed flood forecasting and related programs of the National Weather Service (NWS), the U.S. Geological Survey (USGS), the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), the U.S. Army Corps of Engineers (USACE), and the Washington State Departments of Ecology and Transportation.

"One of our biggest challenges was sorting through the range of resident and community needs in the area and develop an approach with the greatest benefits for the Flood Authority" says Dr. David Curtis, WEST's flood warning system expert and project manager. "There was limited funding available so cost-effective solutions were absolutely necessary. We chose to bring together existing resources and off-the-shelf products as much as possible to create immediate benefits for citizens and the Flood Authority."

WEST's findings led to the creation of a plan to improve flood threat identification, agency coordination, and communication with the public. The plan includes an Internet-based data collection, display, and delivery system plus additional rainfall, temperature and river monitoring stations to fill gaps in existing rain and water level monitoring networks in the Chehalis River Basin. The need for the gages was apparent after the 2007 and 2009 floods. The NWS and other interests in the basin identified "holes" or gaps in the region's river and stream gaging network that hindered flood forecasting. Ten automated rain gages, ten temperature sensors, and two stream gages were added to existing flood threat detection networks.

Today, more than 100 weather and river sensors in the Chehalis River Basin and neighboring areas monitor developing flood conditions. Most of the gages automatically transmit their readings each hour through a satellite data collection system called GOES. When observed rainfall rates are too high or water levels are rising fast, the system sends alarm messages to local emergency managers, giving them a "heads-up" that flooding might occur.

The new gages are critically important to confirm the information from the new multi-million dollar NWS Doppler radar installed at Langley Hill, WA, near the mouth of the Chehalis River. It's all part of a coordinated multi-agency effort to improve flood warning in the basin that has been strongly supported by the local congressional delegation.

According to Brent Bower, NWS Hydrologist in Seattle, “Rainfall is one of the most important inputs to river forecasts and more gages will help improve the forecasts. In addition, the network of gages helps forecasters do a better job of verifying the structure of storms coming ashore which results in better short-term weather forecasts.” Bowers adds “Rain gages are absolutely critical to turning radar information into actual estimates of rainfall.”

The public can view flood data on the Authority’s Contrail website (See http://lewiscountywa.gov/chehalis-river-basin-flood-authority for access instructions.). Rain, stream, reservoir, wind, temperature, and other weather information are collected, displayed, and used immediately. Users can access current conditions in the basin along with the latest NWS river forecasts, check for local road closures from the Washington Department of Transportation and find other flood preparedness information from federal, state, and local sources.

The Contrail flood inundation maps show the public, as well as government officials, where flooding is to be expected at each forecasted river stage. The website provides real time access to flooding data, putting the information in a local context, enabling residents to be better prepared.

The Chehalis River Basin Flood Warning System got its first test one week after the public rollout of the system and website in November, 2011. "It's great having real-time river and rain data, weather forecasts, and flood inundation maps all available in one location," reports Dan Thompson, Public Works Director for the City of Oakville and Chehalis River Basin Flood Authority Board Member. "More and more people are using the system to be better prepared for developing flood conditions."

The Chehalis River Basin Flood Authority (Flood Authority) is comprised of 12 member agencies including Grays Harbor County, Lewis County, Thurston County, City of Aberdeen, Town of Bucoda, City of Centralia, City of Chehalis, City of Cosmopolis, City of Montesano, City of Napavine, City of Oakville, and the Town of Pe Ell. For more information go the Chehalis River Basin Flood Authority website: http://lewiscountywa.gov/chehalis-river-basin-flood-authority.

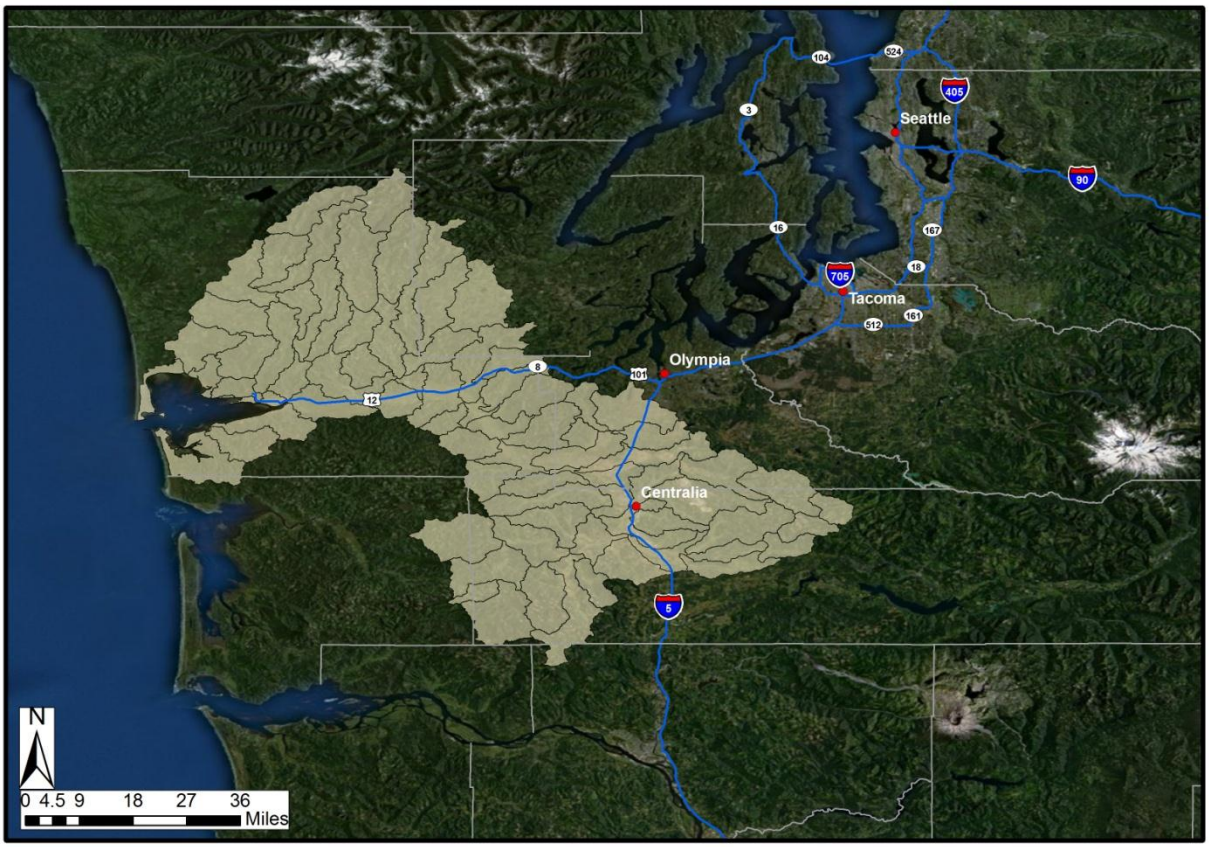

Figure 1: Chehalis River Basin

Figure 2: Solar powered automatic rainfall and temperature gaging station in the Chehalis River Basin. Observations are reported hourly using the GOES satellite.

Figure 3: Installing rainfall and temperature station at Riverside Fire Authority site.

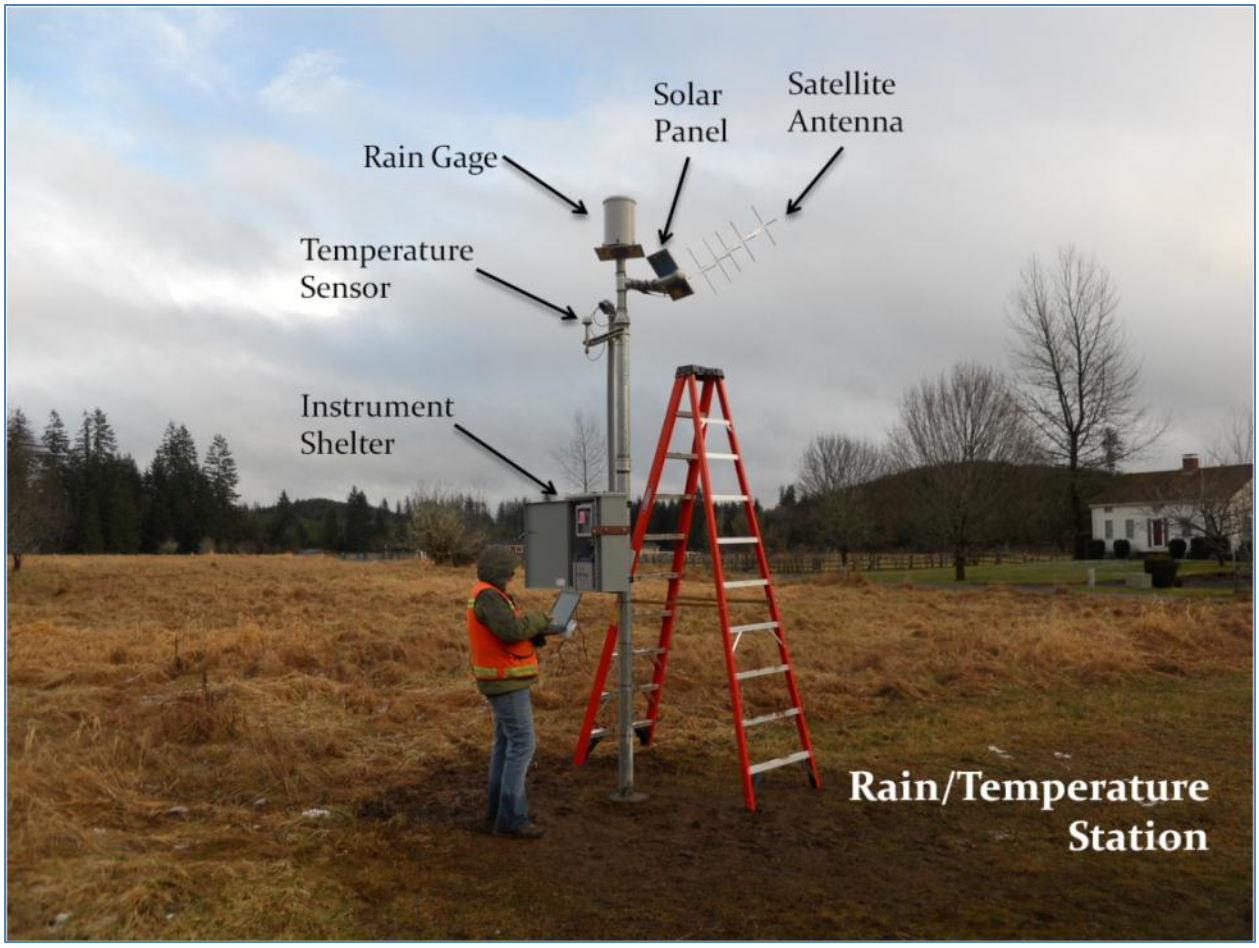

Figure 4: Installing rainfall and temperature station at Riverside Fire Authority site. (with annotations_)

Figure 5: Rain, temperature, and stream gages on the West Fork Satsup River

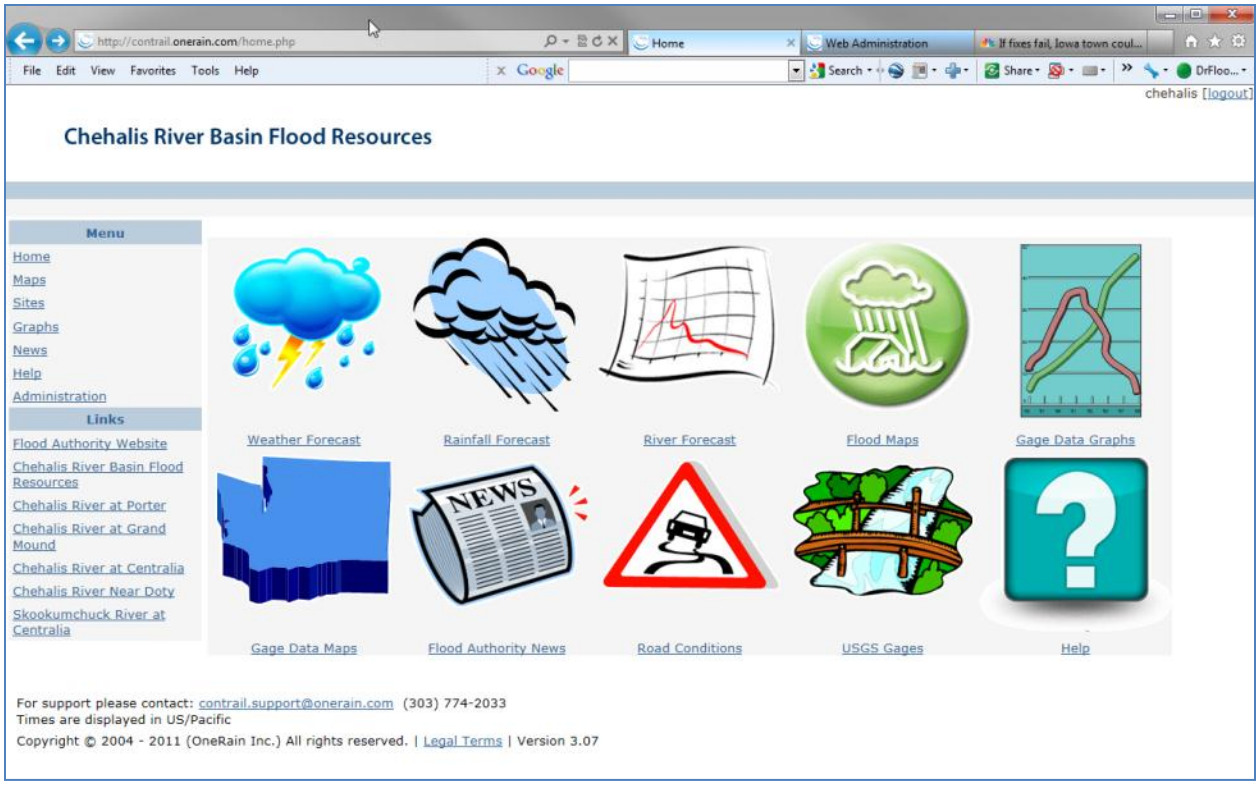

Figure 6: Chehalis River Basin Flood Warning System Home Page (contrail.onerain.com). Users access NWS weather and river forecasts, observed rain, temperature, and river elevations, flood inundation maps, and road closures.

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